

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-6 are pending in the present application. Claims 1-6 are amended by the present amendment.

In the outstanding Office Action, Claims 1-6 were rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent No. 5,917,729 to Naganuma et al. (hereinafter “Naganuma”), European Patent Publication No. 0684572 A2 (hereinafter “patent ‘572”), and further in view of U.S. Patent No. 5,564,022 to Debnath et al. (hereinafter “Debnath”).

Applicant’s representatives thank Examiners Perveen and Patel for granting the interview conducted on May 20, 2004. During the interview, differences between the claimed invention and the applied references were discussed. The present response sets forth the substance of those discussions, which Examiners Perveen and Patel agreed as showing the claims to distinguish over the applied references.

Addressing now the rejection of Claims 1-6, under § 103(a) as unpatentable over Naganuma, patent ‘572, and Debnath, that rejection is respectfully traversed.

Amended Claim 1 is directed to a placement and routing method for a clock distribution circuit which receives a clock and supplies the clock to a load circuit. The method includes:

(a) placing and routing a group of driver elements having a common input capacitance to form said clock distribution circuit;

(b) selectively replacing a first element belonging to said group of driver elements with a second element chosen from among a plurality of elements having the common input capacitance and differing from the first element with respect to (i) driving capability, (ii) having an opened output pin, or (iii) being a capacitance element interposed between an input pin and a stable potential line;

(c) repeating said selectively replacing said first element with said second element until an evaluated value of clock skew becomes equal to or smaller than a target value.

Independent Claim 6 recites similar features. Claims 2-4 depend from amended independent Claim 1.

By way of background, conventional techniques for adjusting clock skew include replacing driver elements with substitute elements having different driving capabilities and different input capacitances.¹ If the substitute element has a different input capacitance, the preceding circuitry may require alteration.² Similarly, if the substitute element has different input and output pin positions, the surrounding circuitry may require alteration.³ As either alteration may affect clock skew, the conventional techniques may require significant trial and error to precisely adjust the clock skew.⁴ The claimed invention is provided, at least, in view of this deficiency.

In a non-limiting example, Figures 2, 6, and 8 illustrate embodiments of the claimed invention. As shown in Figure 2, the output pin of replacement elements 4h and 4i are opened. As shown in Figure 6, replacement elements 43a and 43b are capacitance elements interposed between an input pin and a stable potential line. As shown in Figure 8, the driving capabilities of replacement elements 42a and 42b are different than the driving capabilities of the replaced elements. In each instance, the input capacitance of the replacement elements are the same as the input capacitances of the elements they replaced. Accordingly, the preceding circuitry requires no alteration.

As discussed during the interview, the applied references do not teach the claimed limitation of replacing a first element with another element having a common input capacitance, and differing from the first element with respect to driving capability, having an

¹ Specification, page 3, lines 13-15.

² Specification, page 3, lines 16-19.

³ Specification, page 3, lines 19-22.

⁴ Specification, page 3, lines 22-25.

open output pin, or being a capacitance element. Accordingly, Applicant respectfully requests that the rejection of independent Claims 1 and 6, and the claims depending directly or indirectly therefrom, be withdrawn.

Amended Claim 5 is also directed to a placement and routing method for a clock distribution circuit which receives a clock and supplies the clock to a load circuit. The method includes:

Claim 5 (Currently Amended): A placement and routing method for a clock distribution circuit which receives a clock and supplies the clock to a load circuit, said method comprising ~~the steps of~~:

(a) placing and routing a group of driver elements having input pins and output pins respectively placed in equivalent positions as one another to form said clock distribution circuit;

(b) selectively replacing a first element belonging to said group of driver elements with a second element chosen from among a plurality of driver elements having a different driving capability than said first element and having input pins and output pins respectively placed in equivalent positions as said first element; and

(c) repeating said selectively replacing said first element with said second element until an evaluated value of clock skew becomes equal to or smaller than a target value.

Thus, Claim 5 does not recite the limitation of replacing the first element with a second element having the same input capacitance. Rather, Claim 5 recites that the second element has a different driving capability than the first element, but has input and output pins placed in equivalent positions as the first element.

In a non-limiting example, amended Figure 7 illustrates an embodiment of the claimed invention. As shown, drivers are replaced S53 with replacement drivers having a different driving capabilities and input/output pins placed in equivalent layout positions as the replaced driver.⁵

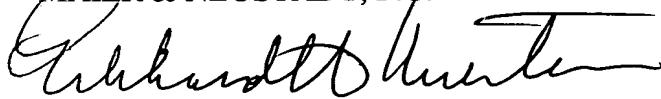
⁵ Specification, page 17, lines 24-page 18, line 5.

As discussed during the interview, the applied references do not teach the claimed limitation of replacing a first driver element with a second driver element having equivalent input/output pin positions. Accordingly, Applicant respectfully requests that the rejection of Claim 5 be withdrawn.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance, and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBŁON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)

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